

What is Claimed is:

1. A humidity control system for a fuel cell stack, comprising:

a gas supply;

a humidifier including an inlet connected to said gas supply and an outlet;

a fuel cell stack including an inlet that is connected to said outlet of said humidifier;

a bypass line having one end connected between said gas supply and said humidifier and an opposite end connected between said outlet of said humidifier and said inlet of said fuel cell stack; and

a valve located in said bypass line.

2. The humidity control system of claim 1 wherein said valve is one of a gas restriction valve and a throttle valve.

3. The humidity control system of claim 1 wherein said valve controls the amount of gas flowing from said gas supply through said humidifier to said fuel cell stack and through said bypass line to said fuel cell stack.

4. The humidity control system of claim 1 further comprising:
  - a humidity sensor for generating a humidity signal based on the humidity of gas entering said fuel cell stack; and
  - a controller connected to said humidity sensor and said valve for controlling said valve based on said humidity signal.
5. The humidity control system of claim 1 wherein said inlet of said fuel cell stack is one of a cathode flow line and an anode flow line of said fuel cell stack.

6. A humidity control system for a fuel cell stack, comprising:

- a gas supply;
- a humidifier including an inlet connected to said gas supply and an outlet;
- a fuel cell stack including an inlet that is connected to said outlet of said humidifier;
- a valve located between said gas supply and said inlet of said humidifier; and
- a bypass line having one end connected to said valve and an opposite end connected between said outlet of said humidifier and said inlet of said fuel cell stack.

7. The humidity control system of claim 6 wherein said valve is a directional valve.

8. The humidity control system of claim 6 wherein said valve controls the amount of gas flowing from said gas supply through said humidifier to said fuel cell stack and through said bypass line to said fuel cell stack.

9. The humidity control system of claim 6 further comprising:

a humidity sensor for generating a humidity signal based on the humidity of gas entering said fuel cell stack; and

a controller connected to said humidity sensor and said valve for controlling said valve based on said humidity signal.

10. The humidity control system of claim 6 wherein inlet of said fuel cell stack is one of a cathode flow line and an anode flow line of said fuel cell stack.

11. A humidity control system for a fuel cell stack, comprising:
  - a gas supply;
  - a humidifier including an inlet connected to said gas supply and an outlet;
  - a fuel cell stack including an inlet that is connected to said outlet of said humidifier;
  - a valve located between said outlet of said humidifier and said inlet of said fuel cell stack; and
  - a bypass line having one end connected to said valve and an opposite end connected between said gas supply and said inlet of said humidifier.
12. The humidity control system of claim 11 wherein said valve is a directional valve.
13. The humidity control system of claim 11 wherein said valve controls the amount of gas flowing from said gas supply through said humidifier to said fuel cell stack and through said bypass line to said fuel cell stack.

14. The humidity control system of claim 11 further comprising:

a humidity sensor for generating a humidity signal based on the humidity of gas entering said fuel cell stack; and

a controller connected to said humidity sensor and said valve for controlling said valve based on said humidity signal.

15. The humidity control system of claim 11 wherein said inlet of said fuel cell stack is one of a cathode flow line and an anode flow line of said fuel cell stack.

16. A humidity control system for a fuel cell stack, comprising:

a gas supply;

a humidifier including an inlet connected to said gas supply and an outlet;

a fuel cell stack including a second inlet that is connected to said outlet of said humidifier;

a valve located between said gas supply and said inlet of said humidifier; and

a bypass line having one end connected between said gas supply and said valve and an opposite end connected between said outlet of said humidifier and said inlet of said fuel cell stack.

17. The humidity control system of claim 16 wherein said valve is one of an air restriction valve and a throttle valve.

18. The humidity control system of claim 16 wherein said valve controls the amount of gas flowing from said gas supply through said humidifier to said fuel cell stack and through said bypass line to said fuel cell stack.

19. The humidity control system of claim 16 further comprising:

a humidity sensor for generating a humidity signal based on the humidity of gas entering said fuel cell stack; and

a controller connected to said humidity sensor and said valve for controlling said valve based on said humidity signal.

20. The humidity control system of claim 16 wherein said inlet of said fuel cell stack is one of a cathode flow line and an anode flow line of said fuel cell stack.

21. A humidity control system for a fuel cell stack, comprising:

- a gas supply;
- a humidifier including an inlet connected to said gas supply and an outlet;
- a fuel cell stack including an inlet that is connected to said outlet of said humidifier;
- a valve located between said outlet of said humidifier and said inlet of said fuel cell stack; and
- a bypass line having one end connected between said valve and said inlet of said fuel cell stack and an opposite end connected between said gas supply and said inlet of said humidifier.

22. The humidity control system of claim 21 wherein said valve is one of an air restriction valve and a throttle valve.

23. The humidity control system of claim 21 wherein said valve controls the amount of gas flowing from said gas supply through said humidifier to said fuel cell stack and through said bypass line to said fuel cell stack.

24. The humidity control system of claim 21 further comprising:

a humidity sensor for generating a humidity signal based on the humidity of gas entering said fuel cell stack; and

a controller connected to said humidity sensor and said valve for controlling said valve based on said humidity signal.

25. The humidity control system of claim 21 wherein said inlet of said fuel cell stack is one of a cathode flow line and an anode flow line of said fuel cell stack.